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to its former level, and probably some amount of permanent depression remained.—In the same magazine, Mr. Woodward describes five species of phyllopod Crustacea from shields found in the Upper Devonian of the Eifel, and one from the Wenlock shale of South Wales; Mr. W. H. Twelvetrees has some notes upon the geology of the country at the base of the southwest slopes of the Urals; Mr. S. V. Wood continues his argument for the formation of the Loess from the sliding into the valleys of the thawed soil-cap annually left unprotected upon the heights: Mr. Howorth adduces the evidence of the valley terraces in favor of the occurrence of a great post-glacial flood; and Mr. Flight continues his history of meteorites.—Among the numerous interesting and valuable papers contained in the Bulletin of the Geological Society of France, during the year 1881, are the following: On the importance of the central chamber of the Nummulites, by M. de la Harpe; On the Micaceous schists of the environs of Saint-Léon (Allier), France, by M. Michel-Lévy; On the connection between the propagation of heat with the cleavage of rocks and the movements of the soil that have produced them, by M. Ed. Jannettaz; Note on the Tertiary Echinidæ of Belgium, by M. Cotteau; On the geology of the environs of Saint-Amand, by M. Dagincourt; The Quaternary of Chelles, by M. Ameghino; Contact of the Bathonian and Callovian beds on the eastern border of the Paris basin, by J. Wohlgemuth; First fruits of the Eocene flora of Bois-Gouët (Loire Inferieur), by M. Ed. Bureau, with descriptions of two new species; On the geology of the Pyrenees of Navarre, Guipuzcoa and Labourd, by M. P.-W. Stuart-Menteth; On the general geology of Spain, by M. P. Rey-Lescure; On the Lingulæ of the “grès” Armorican of La Sarte, by M. A. Guillier; Geological notes on French Guiana, after the explorations of Dr. Crevaux, by M. Ch. Velain, with a map of the province, and numerous figures of sections of the rocks. The river Oyapock, though only 435 kilometres in length, carries down more water than the Rhone, and the greater portion of its course is among gneissic rocks mingled with granite, which cause numerous cascades, and render its ascent impracticable; Synchronism of the Turonian of the Southwest with that of the south of France, by M. H. Arnaud.

#### MINERALOGY.<sup>1</sup>

SOME NEW MINERALS IN METEORITES.—An examination of a mass of meteoric iron from Melbourne, Australia, has been made by Dr. W. Flight,<sup>2</sup> of the British Museum, with the result of the discovery of several new compounds of nickel and iron.

The meteorite, which fell in 1854, consists entirely of metallic minerals, containing no rocky matter. The iron contains 7-9

<sup>1</sup> Edited by Professor H. CARVILL LEWIS, Academy of Natural Sciences, Philadelphia, to whom communications, papers for review, etc., should be sent.

<sup>2</sup> Proc. Royal Soc., No. 218, p. 343.

per cent. of nickel, with small percentages of cobalt, silicon and copper. Lying on the plates of meteoric iron, which make up the mass, are thin metallic flexible plates of the thickness of writing paper of a substance having the composition  $\text{Fe}_5\text{Ni}_2$ . It is this mineral which forms the figures on etched surfaces, and not, as generally believed, schreibersite. The name *Edmonsonite* is proposed for this mineral.

Nodules of troilite and graphite, and square prisms of what appears to be rhabdite ( $\text{Fe}_4\text{Ni}_3$ ) P. occur through the mass.

Two other minerals were noticed, and are probably new. One occurs as brass-colored oblique crystals, cleavable across the base, and having a composition agreeing with the formula ( $\text{Fe}_9\text{Ni}_2$ ) P<sub>2</sub>. Another phosphide whose formula was ( $\text{Fe}_7\text{Ni}_2$ ) P. occurred in square prisms, bright externally, and dull, almost black within.

The occluded gases in the meteorite amounted in bulk to 3.59 times the volume of the iron, and consisted of carbonic acid, 0.12; carbonic oxide, 31.88; hydrogen, 45.79; marsh-gas, 4.55; nitrogen, 17.66.

**CORUNDUM AND ITS ALTERATIONS.**—Dr. F. A. Genth has made another valuable contribution to our knowledge of the genesis of minerals in a paper read before the American Philosophical Society, on August, 18, 1882. The paper is in part an appendix to his former paper on corundum and its alterations, and in part a collection of mineralogical notes on various subjects.

Of the alterations of corundum, the first described is an alteration into spinel of the corundum from Carter mine, Madison county, N. C. When containing fissures, it was observed, sometimes only by a small dark line, that a change had commenced, which, extending sometimes through large masses, had converted the corundum into a massive greenish-black spinel of granular structure. The spinel finally passes into prochlorite. Particles of spinel were also observed in corundum from Shimersville, Lehigh county, Pa., and were regarded as the result of alteration. At Toures county, Ga., corundum was surrounded by an alteration into greenish-white, cleavable zoisite.

Several examples are given of the alteration of corundum into feldspar. The oligoclase of Unionville, Pa., is regarded as such an alteration. A number of instances are given of alteration into mica. A specimen from Haywood co., N. C., showed a large crystal of muscovite to which albite was attached, while through both substances there occurred remnants of corundum crystals, disseminated through the mass. The particles of corundum are corroded as though by a dissolving agent, and the whole mass has the appearance of a coarse granite in which corundum replaces the quartz. In some specimens from Alabama, the corundum crystals are surrounded by a layer of sub-fibrous mica, outside of which is a fine scaly mica, much of which has changed into brown scales, which exfoliate when heated. The corundum is rounded and corroded,

but the sub-fibrous mica forms a ring around it with perfect hexagonal sides and sharp edges. Many of the crystals are almost completely changed into compact mica.

Several new localities are given of the alteration of corundum into margarite, fibrolite and cyanite. The interesting fact is recorded, that since these alterations of corundum occur in rounded masses in the gravel beds of the Southern States, the alterations here described must have taken place prior to the formation of the graveldeposits.

Of other alterations, those of orthoclase into albite, and of talc into anthophyllite are described. Some very interesting pseudomorphs of talc after magnetite, from the great serpentine bed in Harford county, Maryland, were observed. Octahedrons of talc, of a white color and pearly lustre, had the scales arranged parallel to the octahedral planes, and sometimes contained a nucleus of magnetite, more or less altered. Dark spots often of definite shape occur throughout the steatite bed, and it is suggested that the entire steatite bed is an alteration from one of magnetite.

Analyses are given of gahnite from North Carolina and Colorado, and some alterations of the latter into a chloritic mineral are described.

Minute grains of rutile and zircon were detected in the "Edge Hill rocks," of Bucks county, Pa. Small crystals of sphalerite and prehnite from Cornwell, Pa., are analyzed and described. A compact variety of pyrophyllite, having the appearance of kaolinite, and not exfoliating when heated, was described as occurring in seams in the slates and anthracite of Drifton, Luzerne county, Pa. Analyses of beryl and allanite from Alexander county, N. C., and of niccolite from Colorado are given, and some octahedral, cavernous crystals from a furnace bottom at Argo, Colorado, are shown by analysis to be probably artificial alisonite.

The paper contains numerous analyses which are especially valuable from the well known accuracy of Dr. Genth's work.

THE PARAGENESIS OF MINERALS.—The study of the origin, successive formation and repeated alterations of minerals, is one of the most fruitful branches of mineralogy. As such studies progress, the science becomes more generic, and, entering a broader field, ranks with geology in unfolding the cosmogonic truths.

Of recent mineralogical papers, one of the most important is that by Professor B. K. Emerson<sup>1</sup> on the minerals of the Deerfield Dyke. Not only is each species carefully described, but its precise method of occurrence and of association with other minerals is given so as to show its comparative *age*. A table is added which shows at a glance the paragenesis of the species found.

Chemical analyses were not needed to establish the results obtained, and the mere inspection of the locality with the exact description given, is of far greater value than any list of chemical

<sup>1</sup> Amer. Journ. Sci., Nov., 1882.

analyses, such as would have contented most writers, while chemical analyses are often needed to establish the identity of a species. The broader study of the *origin of species* can be done by close observation alone.

The attention of our younger mineralogists should be particularly called to the value of a full description of the *associations* of minerals. The selected specimens in our cabinets, from which all "dirt" has been removed can teach us nothing of their origin. It is the rough masses in their natural home, interpenetrated by more recent minerals, or occurring in veins in those which are older, which, with their products of decomposition, are most worthy of study, both macroscopically and microscopically. A study of mineralogical development may finally lead to a new basis of classification, such as has already been attempted in lithology.

A MOUNTAIN OF MARTITE.—An iron mountain, the Cerro de Mercedo, which rises abruptly out of the plain near the city of Durango, Mexico, and which, a mile in length, is so covered by masses of iron ore as to conceal all rock outcrops has been reported upon by Mr. John Birkenbine, and the ore further described by Professor B. Silliman. The ore has the streak and composition of hematite, but the octahedral character of the crystals showed it to be martite, and it is probable that the whole mass has been altered from magnetite.

ANALYSIS OF HELVITE.—Mr. R. Haines contributes to the Franklin Institute Journal, a correction of his analysis of the Helvite, from Amelia Co., Virginia, found by the writer and first recorded in the April NATURALIST. A re-examination of the specific gravity showed his first determination to have been erroneous, owing to the small amount of material at hand. It is now found to be 3.29. A new analysis gave total  $\text{SiO}_2$ , 32.49 per cent. of which 5.17 per cent. was insoluble in sodic carbonate, and is regarded as gangue. The full analysis was not completed.

#### GEOGRAPHY AND TRAVELS.<sup>1</sup>

PROCEEDINGS OF THE GEOGRAPHICAL SECTION OF THE BRITISH ASSOCIATION.—The meeting of the British Association for the Advancement of Science, this year, was held at Southampton, from August 23d to 30th.

The subject of the opening address of the president of the Geographical Section, was the Central Plateau of Asia.

"This area," he said, "which is one of the most wonderful on the surface of the earth, contains nearly 3,000,000 of English square miles, and is equal to three-fourths of Europe. Its limits, its exterior configuration, its central and commanding situation in the Asiatic continent, will be clearly perceived from the large diagram of Asia which is exhibited here. As compared with some of the more favored regions, it is singularly destitute of natural advantages. Though it has several deep depressions of surface, yet its general elevation is very considerable, and some of

<sup>1</sup>Edited by ELLIS H. YARNALL, Philadelphia.